

What is claimed is:

1. A color laser display apparatus comprising:

a laser light source which emits ultraviolet laser light;

5 a modulation unit which modulates said ultraviolet laser light;

a display unit which includes a fluorescent screen; and

10 a scanning unit which two-dimensionally scans said fluorescent screen with said ultraviolet laser light;

said fluorescent screen including for each pixel,

15 red fluorescent material which emits red light in response to said ultraviolet laser light,

green fluorescent material which emits green light in response to said ultraviolet laser light, and

20 blue fluorescent material which emits blue light in response to said ultraviolet laser light.

2. A color laser display apparatus according to claim 1, wherein said laser light source is a semiconductor laser device having an active layer made of a GaN material.

3. A color laser display apparatus according to claim 2, wherein said semiconductor laser device is one of a tapered-amplifier type, an α -DFB type, a phase-synchronization array type, and a surface emitting type.

4. A color laser display apparatus according

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to claim 1, wherein said laser light source includes,

5 a semiconductor laser device which has an active layer made of a GaN material so as to emit excitation laser light, and

10 a surface emitting semiconductor laser device which has an active layer made of a GaN material and formed on a substrate, and is excited by the excitation laser light to emit said ultraviolet laser light.

5. A color laser display apparatus according to claim 1, wherein said laser light source is a fiber laser device including,

5 an excitation light source which emits excitation light,

an optical fiber doped with at least one rare earth element which emits a laser beam when excited by the excitation light, where the at least one rare earth element includes Pr^{3+} , and

10 a wavelength conversion element which converts said laser beam into said ultraviolet laser light.

6. A color laser display apparatus according to claim 1, wherein said red fluorescent material is ZnCdS:Ag , said green fluorescent material is ZnS:Cu , and said blue fluorescent material is ZnS:Ag .

7. A color laser display apparatus according to claim 1, wherein said light source is:

5 a gallium nitride semiconductor laser; or a semiconductor laser excited solid state laser in which a laser beam, obtained by exciting a solid state laser crystal with a gallium nitride semiconductor laser, is wavelength converted by an

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optical wavelength conversion element then emitted;
or

10 a fiber laser or a fiber amplifier in
which a laser beam, obtained by exciting a fiber
with a semiconductor laser that emits light in an
infrared range, is wavelength converted by an
optical wavelength conversion element then emitted;
15 or

 a fiber laser, in which a laser beam,
obtained by exciting a fiber with a gallium nitride
semiconductor laser, is wavelength converted by an
optical wavelength conversion element then emitted.

8. A color laser display according to claim 1,
wherein said laser light modulating means comprises
a spatial light modulator driven by an
electromechanical operation that utilizes static
5 electricity.

9. A color laser display according to claim 8
wherein said spatial light modulator is a digital
micro mirror device comprising a plurality of
movable micro mirrors.

10. A color laser display device according to
claim 8 wherein said spatial light modulator
comprises grating light valve elements of a
reflective diffraction grating type.

11. A color laser display device according to
claim 7 wherein said spatial light modulator
comprises reflective diffraction grating type
grating light valve elements consisting of:

5 a plurality of fixed microelements
having a first reflective surface formed thereon;
and

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a plurality of movable microelements having a second reflective surface formed thereon;

10 wherein said fixed and movable
microelements are alternately arranged on a
substrate in a predetermined direction, so that when
static electricity is applied, the movable
microelements move, changing the distance between
15 the first and second reflective surfaces, thereby
diffracting light incident thereto.

12. A color laser display according to claim 10, wherein said spatial light modulator comprises a plurality of grating light valve elements that are arranged in a single line in a direction substantially perpendicular to said scanning direction, or arranged as a light modulating array in a plurality of rows.

13. A color laser display according to claim 12 wherein the lengthwise direction of the grating of said grating light valve elements match the arranging direction of said light modulating array..

14. A color laser display according to claim 10 wherein said spatial light modulator is positioned so that it is rotated at a predetermined angle in relation to the optical axis around the normal line of the surface thereof.

15. A color laser display according to claim 1 wherein said laser light source comprises:

a first laser light source which is
plurality of gallium nitride semiconductor lasers
5 each coupled to a plurality of fibers; and

a second laser light source which is a plurality of gallium nitride semiconductor lasers

coupled to a plurality of fibers via a wave multiplexing optical system;

10 wherein the fibers of at least one of said first and second laser light sources is arranged in an array form to constitute a linear laser light source that emits a linear laser light flux; or

15 wherein the fibers of at least one of said first second laser light sources is arranged in a bundle form to constitute a planar laser light source that emits a spot beam laser light flux.

16. A color laser display according to claim 1 wherein said laser light source comprises a plurality of laser light sources that emit a light beams with a predetermined wavelength range that
5 includes ultraviolet, and a wave multiplexing optical system that multiplexes the laser light emitted from said plurality of laser light sources.

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